

The phenomenon of the "breaking off short," or notching of the fasciculus of a voluntary muscle in a transverse cleavage of the fibre, is regarded by Dr. Barry as a natural consequence of the interlacing of the larger spirals, which he has described in a former paper; the fracture, in proceeding directly across the fasciculus, taking the direction in which there is least resistance.

The position of the filament in the blood-corpuscle is represented as bearing a striking resemblance to that of the young in the ovum of certain intestinal worms, the filaments of which are reproduced by spontaneous division. The author subjoins the following quære, "Is the blood-corpuscle to be regarded as an ovum?"

May 12, 1842.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

The following papers were read, viz.—

1. "Barometrical Observations, showing the effect of the Direction of the Wind on the Difference between distant Barometers." By Lieut.-Colonel Philip Yorke, S. F. Guards. Communicated by Lieut.-Colonel Sabine, R.A., F.R.S., &c.

The author institutes a comparison between the barometric heights as observed at the Apartments of the Royal Society, and at his house in Herefordshire, in the neighbourhood of Ross, with a view to ascertain the influence of prevailing winds on the atmospheric pressure. The barometers thus compared together were of the same construction, and by the same maker; and the times of observation, namely nine o'clock A.M. and three o'clock P.M., were the same at both places, the distance between which is 110 miles in longitude, and about 20 in latitude. The degree of accordance in the march of the two barometers is exhibited by that of curves traced on three sheets accompanying the paper. The results are given in eight tables. The author agrees with Schubler in ascribing the currents prevailing in the atmosphere to the variable relations of heating and cooling which obtains between the Atlantic Ocean and the continent of Europe at different seasons; the facts ascertained by the series of observations here presented being in accordance with that hypothesis. If the northerly and westerly winds in England be partly the effect of the expansion of the air on the continent, then the barometer which is nearest to the continent, or in this instance that at London, ought to be relatively more depressed than the one more distant; or if the southerly and easterly winds be regarded as proceeding to the ocean, then, for a similar reason, the barometer nearest to the ocean ought to be relatively depressed; and that both these effects are produced, is shown by the tables. This view of the subject also, the author remarks, is corroborated by Raymond's observations, detailed in his memoir on the determination of the height of Clermont Ferrand, from which it appears that with the north winds, the

southern barometer was most depressed ; while the reverse occurred with the southerly winds.

“On the Rectification and Quadrature of the Spherical Ellipse.”
By James Booth, Esq., M.A., Principal of Bristol College. Communicated by John T. Graves, of the Inner Temple, Esq., M.A., F.R.S.

The author, at the commencement of this paper, adverts to a rather complex discussion of a portion of the subject of his inquiry by M. Catalan, published in the *Journal de Mathématiques*, edited by M. Lionville.

He then proceeds to establish two fundamental theorems, applicable to,—1st, the quadrature, and 2nd, the rectification of the spherical ellipse.

1st. The quadrature of the spherical ellipse is reduced to the calculation of a complete elliptic function of the third order, whose parameter and modulus are quantities essentially related to the cone; its parameter being the square of the eccentricity of the ellipse, whose plane is at right angles to the axis of the cone, and its modulus being the sine of the semi-angle between the focals.

2nd. The rectification of the spherical ellipse is made to depend on a complete elliptic function of the third order, whose parameter is the same as in the preceding case, but whose modulus is the sine of the angle between the planes of the elliptic base and of one of the circular sections.

The author then proceeds to establish a remarkable relation between the area of a given spherical ellipse and the length of the spherical ellipse generated by the intersection of the supplemental cone with the same sphere.

He shows that if there are two concentric supplemental cones cut by the surface of a concentric sphere,—1st, the *sum* of their spherical bases, together with twice their lateral surfaces, is equal to the surface of the sphere ; 2nd, the *difference* of their spherical bases is equal to twice the difference of their lateral surfaces.

Hence, also, he deduces a remarkable theorem, viz. the sum of the spherical bases of any cone whose principal angles are supplemental, cut by a sphere, together with twice the lateral surface of the cone comprised within the sphere, is equal to the surface of the sphere.

The author then, alluding to some researches of Professor MacCullagh and of the Rev. Charles Graves, Fellow of Trinity College, Dublin, proceeds to give a simple elementary proof of a well-known formula of rectification, and thence deduces some remarkable properties of the tangent at that point of the ellipse, which is termed by him the point of *rational section*.

Assuming the properties of the plane ellipse, he proceeds to show that a similar formula of rectification holds for any curve generated by the intersection of a spherical surface with a concentric cone of any order. He goes on to develop a series of properties of the spherical ellipse, bearing a striking analogy, as indeed might have been expected, to those of the plane curve. Thus he establishes a